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REVISED NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS

The third edition of the National Directory of Commodity Specifications, Miscellaneous Publication M178, is now available. In this 1,311-page volume will be found listed and briefly described more than 35,000 standards and specifications of trade associations, technical societies, and organizations that are representative in a national way of industry or some branch of industry, as well as the standards and specifications of agencies that represent the Federal Government as a whole.

As in the previous editions, the decimal system of classification of commodities is used. Some minor changes and additions have been made to take care of new material.

The classification system adopted in the Directory tends to group specifications and standards relating to the same subjects, so that specification-making bodies may take note of, or be forewarned concerning duplication of material. If the use of a commodity is not self-evident from the title of the specification, a brief explanation has been given when possible. A summary of each specification is also included so that the reader may to some extent judge for himself whether the scope of the specification fits his particular needs. Cross-referencing serves to tie up related specifications.

A 146-page subject index is provided. Here the commodities are listed alphabetically, and references are given to the classification groups in which the specifications for the particular commodities appear. The names and addresses of the standardizing agencies from which copies of the specifications can be secured are also given.

The Directory was prepared by Paul A. Cooley and Ann E. Rapuzzi under the direction of A. S. McAllister, formerly chief of the Division of Codes and Specifications of the Bureau. Copies of Miscellaneous Publication M178, which is bound in green buckram, are obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. at $4.00.

PLASTICS IN GERMANY

The advances made in the production and application of plastics in Germany during the war period 1939–45 were surveyed by Gordon M. Kline, chief of the Organic Plastics Section of the Bureau,

[1] Published with approval of the Director of the Budget.

during a 3-month investigation conducted under the auspices of the Office of the Chief of Ordnance, War Department. A report of this survey, a summary of which is given below, was recently issued by the Office of The Publication Board, U. S. Department of Commerce, as publication O. P. B. No. 8, Plastics in Germany. Important centers of plastics research and development in that country were visited, including the plants of I. G. Farbenindustrie AG., in Ludwigshafen, Leverkusen, Uerdingen, Hochst, and Gendorf; Dynamit AG., in Troisdorf/Koln; Rohm and Haas AG., in Darmstadt; Alexander Wacker GmbH., in Munich and Burghausen; Th. Goldschmidt AG., in Essen; and Gunther-Wagner, in Hannover.

German manufacturing processes and fabricating technics are well advanced. Their engineers have placed great emphasis on development of continuous processes for the preparation of the raw materials and their conversion into plastics. Four methods of polymerization have been utilized: block or mass, emulsion, pearl or granular, and solution.

German plastic materials are as diversified as our own, but production is generally on a smaller scale than in the United States. Particularly interesting are the various copolymers, which they have found to be useful in such fields as the polyvinyl chlorides, polyacrylates, polyamides, and polystyrenes. Among the new or less well-known polymers that they have been manufacturing are polyvinyl ethers, polyvinyl carbazole, polyethyleneimine, and polyurethanes. In the condensation resin field, special compositions and catalysts have been developed for phenolic, urea, melamine, aniline, and alkyd resins. A new resin was prepared during the war from acetylene and butyphenol for use in improving the working properties of synthetic rubber.

A dry-processed, unplasticized, polyvinyl chloride film, called Luvitherm, is of particular interest. The polyvinyl chloride is rolled and calendered at 165° C, heated for a few seconds at 260° C, and stretched on a roll heated to 120° C. The film of 1.0 to 1.4 mils thickness cannot be heat-sealed easily because of its high tack point but can be cemented with cyclohexanone or tetrahydrofurane. An important application is its use as a recording tape, coated with a solution of magnetic iron oxide and a vinyl copolymer. These tapes were in general use on German radio networks and for military communications.

The polyurethanes are a new development in the plastics field and are not on the market in the United States. In general, they are produced by the reaction of polyisocyanates with polyhydroxy compounds, such as polyesters. They were in use in Germany for the manufacture of fibers, bristles, adhesives, artificial leather, injection molding compounds, and plastic foams.

The polyvinyl ethers are not made in the United States on a large scale, but were being manufactured in Germany during the war at the rate of approximately 600 tons a month. These polymers are used as lacquer constituents, adhesives, and impregnating agents for paper and textiles.

Polyethyleneimine was made at the rate of about 4 tons a month for use as a paper impregnant. It greatly improves the wet strength and scuff resistance of soft crepe paper. It does not detract from the absorbent qualities, hence it was used for towels, bandages, and shoe insoles.

The German army used plastics for many of the same purposes as our own military, for example, signal wire insulation, ammunition fuses, map paper impregnant, gas mask parts, and antigas protective clothing. In addition, scarcity of leather, rubber, and other natural products in Germany had led to many civilian uses, such as shoe soles, bicycle tires, motor-drive belts, harness laces, battery cases, artificial leather, and protective coatings.

SURVEY OF ADHESIVES AND ADHESION

The development of adhesives for bonding metal, wood, rubber, and plastic parts on aircraft has been largely empirical. A better understanding of the physical and chemical forces involved in adhesion is needed for further rational improvement of bonding materials for use in aircraft construction.

Under the sponsorship of the National Advisory Committee for Aeronautics, a research project was undertaken at the Bureau to obtain information on the strengths of bonds between different chemical types of adhesives and adherents. NACA Technical Note No. 989, entitled "Survey of Adhesives and Adhesion," by R. C. Rinker and G. M. Kline, prepared as the initial step in this investigation, comprises a survey of the present knowledge on the nature of adhesion. It includes discussion of (1) the four types of intermolecular and interatomic bonds involved in the attractive forces holding matter together, (2) the chemical and physical forces through which various types of adhesives are attached to solid

surfaces, (3) the effects of various factors on the properties of adhesively bonded structure, and (4) test methods employed for determining tensile and shear bond strengths. A comprehensive bibliography contains references to the technical literature, patents, aircraft, and adhesive manufacturers' reports, and reports of the United States and British Governments.

INSTABILITY OF EXTRUSIONS UNDER COMPRESSIVE LOADS

The compressive strength of open extrusions such as are frequently used in airplane construction, both alone and as reinforcement for thin sheet, is discussed by Walter Ramberg and Samuel Levy in a paper that will be published in the October number of the Journal of the Aeronautical Sciences. The purpose of the program (on a portion of which this report is based) is to compare the measured buckling loads with theoretical loads and to determine strength-weight ratios for extrusions of different shapes and materials.

A review of the literature on the instability of open section extrusions showed that the theory had been worked out in its essentials, but that numerical solutions were confined to sections without the fillets and bulbs that are characteristic of extrusions. The theory is outlined in some detail in this paper in order to make clear the computation of buckling loads for extrusions that are stiffened by fillets and bulbs and the wall thickness of which is not necessarily very small compared to the width of the flanges.

A comparison is given between computed and measured buckling stresses of 125 specimens, including 26 different aluminum-alloy and magnesium-alloy extrusions. The measured critical stresses for 120 of the 125 specimens were found to be scattered within 5,000 pounds per square inch on either side of the computed values. In addition, the paper outlines a procedure for correcting buckling stresses for changes in the properties of the material.

Comparison of the sections tested on a buckling strength-weight basis showed that the thick-walled sections were strongest. Comparison of the sections tested on an ultimate strength-weight basis showed that the Z-sections were most efficient, considering the whole range of length of specimen.

PHYSICAL PROPERTIES OF MICA

Mica is a strategic material in time of war and is indispensable in many modern peacetime applications. An accurate knowledge of its physical properties is therefore important. A paper by Peter Hidnert and George Dickson in the October Journal of Research (RP1675) gives data on the linear thermal expansion, changes in structure, power factors, and effects of heat treatments on thickness, opacity, and color of micas (muscovite, phlogopite, biotite, ripidolite, and zinnwaldite) from different domestic and foreign sources.

The paper gives results of thermal expansion measurements on 30 samples of micas, in a direction perpendicular to the cleavage plane, over the temperature range 20° to 600° or 700° C. Each of the specimens was under load when the measurements were made. Tremendous expansion was noted for some of the samples of phlogopite and biotite micas. Their maximum coefficients of expansion were 0.0552 (between 100° and 114° C), and 0.00411 (between 500° and 600° C) per degree centrigrade, respectively. The coefficients of expansion of the samples of muscovite, ripidolite, and zinnwaldite micas were comparatively low, the maximum for these three types being 0.000036 per degree centigrade.

Some X-ray diffraction patterns were obtained on a few samples of muscovite, phlogopite, and biotite at room temperature and at elevated temperatures. The transitions shown in the expansion curves of two phologopite samples and a biotite sample at elevated temperatures appear to be related to the structural changes indicated in the X-ray diffraction patterns. These changes may be ascribed to the buckling of very thin layers on heating, which causes a displacement or tilting of the elementary crystals of the mica laminas.

The power factors of two samples of phlogopite mica from Madagascar and Mozambique were found to be greater at 100 kilocycles than at 1,000 kilocycles per second, and considerably larger than the power factors of two samples of muscovite mica from Brazil and Guatemala. Heat treatment of the samples of phlogopite and muscovite micas to 600° C, with or without a load, caused considerable increases in the power factors of the former and only slight changes in the latter.

The effects of heat treatments on the thickness, opacity, and color of 50 samples of various micas, were determined. Nearly all of the muscovite samples showed the greatest increases in thickness (up to 155 percent) after heat treatment at 800° C. The results on the changes in thickness of the phlogopite and muscovite samples indicate

that the former resist elevated temperatures better than the latter. The large increases in thickness of nearly all of the muscovite samples accompanied changes from clear or translucent to opaque, or from polychrome to metallic color.

None of the species of mica can be considered as a substance or material of fixed and reproducible properties; there are wide variations in thermal expansion, power factor, and color. These properties of mica depend largely upon the chemical composition, the nature of the crystals, their magnitude and their orientation, the presence of impurities, the way in which these enter the structure, the heat treatment, etc.

Some of the phlogopite and biotite micas, which possess extremely high thermal expansion in a direction perpendicular to the cleavage plane, may be used for high-expanding elements in temperature responsive devices, but on the other hand, may prove unsatisfactory in applications where large changes in dimensions with changes in temperature are not desired.

COLOR STANDARD FOR RUBY MICA

At the request of the Metals Reserve Company and the War Production Board, Deane B. Judd has made a study of the color classification of industrial micas. As set forth in RP 1671 in the October Journal of Research, this classification has been found to be consistent and can be reproduced from the chromaticity of the mica specimen and its daylight transmission considered in relation to thickness. A method of defining ruby mica in these terms is described. As it does not depend upon the physical integrity of any material color standard, this definition constitutes a fundamental color standard for ruby mica. The use of this standard is particularly recommended in the case of micas close to the border line between ruby and nonruby.

NEW STANDARDS FOR COLOR AND TINTING STRENGTH OF PAINT PIGMENTS

Six new standard samples of dry paint pigments suitable for use as standards for color and tinting strength, when such pigments are being purchased on specifications, have been made available since the announcement of the 13 such samples was made in November 1944 (Technical News Bulletin No. 331). New Federal Specifications issued recently mention these standard samples, and state that they may be obtained from the Bureau:

NBS No.	Material	Federal Specification
313	Black iron oxide	TT–I–698
314	Yellow iron oxide, light lemon	TT–Y–216
315	Yellow iron oxide, lemon	TT–Y–216
316	Yellow iron oxide, orange	TT–Y–216
317	Yellow iron oxide, dark orange	TT–Y–216
318	Lampblack	TT–L–70

Orders should be sent to the National Bureau of Standards, Washington 25, D. C., and the identifying number and name of the paint pigment wanted should be given. The price per sample is $2.00, payable in advance. Money orders, etc., should be payable to the Bureau.

HYSTERESIS IN THE PHYSICAL ADSORPTION OF NITROGEN ON BONE CHAR AND OTHER ADSORBENTS

The existence of hysteresis in adsorption phenomena provides evidence that the mechanism of desorption is not, in general, an exact reversal of the mechanism of adsorption. As condensation of a vapor on a free liquid surface and the evaporation therefrom is not subject to hysteresis, it is evident that hysteresis in adsorption is to be associated with some peculiarity of the adsorbing surface. An article in the October Journal of Research (RP1674) by Leland F. Gleysteen and Victor R. Deitz, research associates at the Bureau representing the United States and Canadian Cane Sugar Refiners and the United States Bone Char Manufacturers, discusses hysteresis in the adsorption and desorption of nitrogen at 77° K on a new bone char, a spent bone char, an activated carbon, two silica gels, and a coconut-shell charcoal.

It has been found that hysteresis becomes less pronounced in the above adsorbents in the sequence given, occurring only slightly in coconut-shell charcoal and then only after adsorption had been developed at high relative pressures, in the region of which the Langmuir equation is not obeyed. By means of rate measurements it was shown that it is highly probable that a true steady state was attained in the pressure determinations. These rates are compatible with the requirements of diffusion processes and, moreover, were not appreciably different for such adsorbents as bone char and coconut-shell charcoal, which differ widely in the pore

sizes attributed to them by many investigators. Consequently, surface migration probably predominates in transporting the adsorbed gas molecules from the immediate exterior of the adsorbent into the more elaborate interior structure. The rate of transport does not differ appreciably for adsorbents of large surface area.

After a discussion of those theories of hysteresis that are based upon the concept of capillary condensation, a new interpretation of hysteresis is presented in terms of the theory of multimolecular adsorption. Hysteresis is associated with the experimental fact that the heat of desorption is greater than the heat of adsorption in the pressure range where the hysteresis is observed. A multimolecular layer of adsorbate may be viewed as one whose similarity to the liquid bulk phase must be complete at saturation pressures. Until that point is reached it is probable that there may be more than one type of configuration possible in the complex structure of the multimolecular layer. Molecular clusters of various sizes may form in adsorption gradually at many points on the adsorbent surface with increasing relative pressures, and eventually these are modified by joining together in some fashion. Subsequently, desorption would occur from adsorbed layers of greater stability. Eventually the desorption and adsorption isotherms join together at sufficiently low relative pressure where the surface is depopulated to the extent where molecular clusters are not stable. These considerations have an advantage over the concepts involved in the capillary condensation theories in guiding fundamental researches in physical adsorption along the modern concepts of molecular structure.

SERVICE TESTS OF SOLE LEATHER

Statistical information that should prove helpful in planning tests of materials for shoe soles in actual service is given in a paper by Robert B. Hobbs in the September number of the Journal of the American Leather Chemists Association. Such tests have been widely used in recent years by governmental agencies and commercial organizations in connection with the development of new materials for shoe soles and new methods of treating leather to improve its wear resistance. Although tests in the laboratory can give much valuable information about a treated leather, tests in service are still generally regarded as necessary before such a material can be used commercially.

In this article, tables are presented showing the number of pairs of soles required to insure specified probabilities that the errors will be less than given amounts. The calculations were based on data from a series of tests of vegetable-tanned sole leathers in service. The tests, most of which have been described in previous publications of the Bureau, include those made with the cooperation of the Quartermaster Corps at Camp Lee, Va., those at Woodrow Wilson High School, Washington, D. C., and some tests made with the cooperation of members of the Bureau's staff. It is also shown how the number of pairs may be greatly reduced by selecting soles in a pair from corresponding locations on bends. The original data were in the form of "quality ratios," or ratios between the rates of wear of the soles in a pair, a method of expressing the results that has been used frequently in recent years.

The data also show that the difference in wear between the average for shoes worn on right feet and the average for shoes worn on left feet is so small as to be generally negligible in practice, so that "reverse resoling," the procedure of having each wearer wear out two pairs of test soles, one with the standard sole on the right and one with it on the left foot, is necessary only when the test includes a small number of wearers, among whom may be some who abrade the leathers on right and left feet at different rates.

COMPRESSION OF SOLE LEATHER

An investigation, designed to obtain information on the compressive characteristics of commercial sole leather and to determine the correlation existing between the results of compressive tests and the usual types of indentation tests, was recently completed by Charles E. Weir of the Bureau's Leather Section.

The resistance of sole leather to indentation may be determined by forcing a spherical or a plane circular indenter into the surface of the specimen. The depth of penetration under a given load, or the increase in depth of penetration produced by an increment of load, is taken as the measure of the indentation. Such methods are satisfactory if the material being tested is homogeneous, but are of dubious value for materials that are not uniform. Leather is not homogeneous. It exhibits numerous surface irregularities, and the results of indentation measurements may show a wide

variation at neighboring points on a leather specimen. In order to minimize this variation, a method was developed in which a slab of sole leather is subjected to pressure between plane metal plates. This method is described in Federal Specification for Leather and Leather Products, General Specifications KK–L–311.

Recent studies at the Bureau have shown that additional compression of sole leather improves the resistance to wear. It has also been shown that the greater the resistance of sole leather to indentation, the better the resistance to wear. As additional compression increases the resistance of sole leather both to further compression and also to identation, the two methods appear to measure closely related properties of leather that are associated with the ability to resist wear.

As explained in the Journal of Research for October (RP1672) in the present work the change in thickness resulting from compression of sole leather was compared with the indentation results obtained with each of three instruments. To obtain correlation between these methods it was found that leather should be compressed in the dry state.

From stress-strain measurements it was found that the area and shape of specimens had small effect on the results of the compression. To compensate for variations in thickness, it was found necessary to express the results of compressive tests in terms of percentage compression. The effect of tannery rolling in compressing leather was estimated to be equivalent to that produced by pressures of from 2,000 to 3,000 pounds per square inch. Based on the data obtained in the compressive tests, the lower limit of the coefficient of compressibility of leather was estimated to be 33×10^{-6} bar^{-1}.

KNOCK RATINGS OF GASOLINE SUBSTITUTES

Early in the war, Axis submarine packs were able to roam the Atlantic almost at will, preying on United Nations' tankers to such an extent that it appeared probable that shipment of gasoline for nonmilitary use from the United States to neutral or friendly nonbelligerent countries might have to be seriously curtailed or discontinued altogether. Foreseeing the effects of such a move on the countries affected, the Foreign Economic Administration (then the Board of Economic Welfare, later the Office of Economic Warfare) charged the Bureau with the problem of investigating the characteristics of materials that might be used as substitute fuels for internal combustion engines (Technical News Bulletins 339 and 341 (July and September 1945)).

One of the first steps in the survey of the properties and effects of the use of available substitutes was a study of their antiknock qualities. This study, the results of which will be published as RP1673 by Afton D. Puckett in the October number of the Journal of Research, included the determination of octane numbers of both liquid and gaseous fuels by current standard test procedures. Carbon monoxide, one of the chief constituents of automotive producer gas, was found to rate well above 100 octane number. The paraffinic gases, from methane through the butanes, were also found to be high in antiknock value, ranging from well above 100 for methane down to 90 ASTM motor octane number for normal butane. All the olefinic gases through C_4 were found to be equal to or better than present premium grade motor fuels.

The liquid substitute fuels investigated, listed in order of descending octane number, were acetone, ethyl alcohol, normal butyl alcohol, and diethyl ether. Ether was included in the study, in spite of its known knocking tendency, because of the possibility of using it to improve the volatility of other substitutes. Blends containing varying percentages of ether in ethyl alcohol were found to have somewhat peculiar characteristics, but octane numbers indicated that blends containing ether in amounts less than 45 volume percent should give knock-free performance in most present automotive equipment.

Because of the necessity for conserving tetraethyl lead, as well as extending gasoline supplies, the amount of ethyl alcohol necessary to raise the knock rating of a 68 motor octane number straight-run gasoline to 70 and to 75 motor octane number was determined. With this particular gasoline, 5 volume percent and 16.3 volume percent, respectively, of alcohol accomplished these increases in knock rating, as did 0.25 and 1.1 milliliters of tetraethyl lead a gallon. Knock ratings were determined on blends of acetone and ethyl and normal butyl alcohols in a straight-run naphtha, as well as in gasoline. Although the octane number of acetone exceeds that of ethyl alcohol, it is less effective in blends. Both acetone and ethyl alcohol exhibited lower blending values in a shale-oil motor fuel than in straight-run gasolines and naphthas.

SIMULATED SERVICE TESTS OF AUTOMOTIVE ANTIFREEZE COMPOUNDS

Early in the war, the Bureau was asked by the War Production Board to determine the relative corrosion resulting from the use of glycol and of brine antifreeze compounds (Technical News Bulletin No. 311, March 1943). As no laboratory test was then known to be satisfactory, engine-and-radiator units were assembled, and were run 24 hours a day, 7 days a week, for several months. Such tests are quite expensive; the gasoline consumption was over 400 gallons a week. A study was therefore made of simulated service tests, and a unit was designed, incorporating an automobile radiator and water pump, with a 5-gallon iron container mounted on an electric hotplate to simulate the engine. Pump speed and coolant temperature were subject to close control. Test specimens were immersed in the coolant to determine the corrosion of various metals.

Experiments with the antifreezes used in actual engines show that the Bureau's test unit duplicates engine tests, but at an accelerated rate. The brine antifreeze, which ruined an alumium cylinder head in 3 weeks, destroyed the aluminum test specimen in 4 days. A 1,000-hour test on a glycol antifreeze revealed corrosion only faintly indicated in 4 months of engine testing. Nine of these units are in service, and a number of standard and experimental antifreezes have undergone test.

COMMERCIAL STANDARD FOR TANK MOUNTED AIR COMPRESSORS

Printed copies of Commercial Standard CS126–45, Tank Mounted Air Compressors, which will become effective for new production from December 5, 1945, are now available. The standard covers methods of testing, rating, motor loading, definitions, size classifications, minimum over-all efficiencies in cubic feet per kilowatt hour, standard equipment, warranty and guarantee of compliance, which the manufacturers will place upon each compressor conforming to the standard.

These compressors are the types regularly used by filling stations, garages, automobile service stations, tire dealers, and others, to supply compressed air for tires, lifts, air-operated grease guns, paint sprayers, and the like. The sizes range from ¼ to 10 horsepower, and cover both single- and two-stage models.

It is confidently expected that the standard will provide a basis for better understanding between buyers and sellers of tank-mounted air compressors as to sizes, ratings, equipment, and efficiencies, as well as a basis for fair competition, without in any way hampering the individual manufacturer as to sales points of superiority, details of design, or future improvements.

Copies may be purchased from the Superintendent of Documents, Washington 25, D. C., at 10 cents each.

PHAON H. BATES RETIRES

Phaon H. Bates, chief of the Division of Clay and Silicate Products, and a member of the Bureau's staff since 1910, exercised his optional retirement privilege on September 15, 1945. Mr. Bates was born August 1, 1879, in Sipesville, Somerset County, Pa., and received his education in the public schools of Philadelphia and at the University of Pennsylvania, choosing chemistry as his profession. He served in the chemical laboratory of the Pennsylvania Railroad where he analyzed miscellaneous supplies and later joined the staff of their locomotive testing plant, where he worked on coals, ashes, and combustion products. From 1906 to 1910 he served as a chemist in the Pittsburgh laboratory of the United States Geological Survey.

When, on July 1, 1910, the functions of the Pittsburgh laboratory were divided between the newly established Bureau of Mines and the National Bureau of Standards, he was transferred to the latter. Continued as the Pittsburgh branch of the Bureau, a laboratory was maintained on the grounds of the old United States Arsenal in that city for ceramic research and the testing of structural materials; he became principal chemist of this laboratory, and was placed in entire charge of the work. Because of unsettled conditions prior to World War I, it appeared that the United States would be cut off from its supply of optical glass, and facilities for its production were not available in this country. Mr. Bates organized an experimental program that ultimately led to the manufacture of high-grade optical glass in the Pittsburgh laboratory.

On the completion of the Bureau's Industrial Building in 1919, the major portion of the work of the Pittsburgh branch was transferred to Washington,

where it was consolidated with other projects to form a new division concerned with engineering and structural materials. This eventually became the present Division of Clay and Silicate Products, covering the fields of whiteware, optical glass, refractories, ceramic coatings, cement and concrete, lime and gypsum, stone, and masonry construction. This division played a leading part in the extensive test program on building materials and structures conducted during the years just preceding the war, the results of which have been published in a series of more than 100 reports.

During World War II, the optical glass laboratory assumed the proportions of a fair-sized industrial plant, with all the usual difficulties of recruiting personnel and meeting exacting production schedules. That these difficulties were overcome is due in no small measure to the work of Mr. Bates. Another important contribution of the Division was the development of a new ceramic coating for the protection of metal parts against corrosion at high temperatures. This was used on the exhaust systems of aircraft and amphibious vehicles.

Mr. Bates has always taken a leading part in the development of testing methods, and likewise in the preparation of Federal and other nationally used specifications. In recognition of his outstanding reputation in this field, he was elected president of the American Society for Testing Materials at its 47th annual meeting in June 1944, serving until June 30 of the present year. He delivered the 1940 Edgar Marburg Lecture to this Society, a lecture given annually by an outstanding technical authority as a means of emphasizing the promotion of knowledge of engineering materials.

Mr. Bates has been closely identified for many years with the work of the American Ceramic Society, of which he is a fellow, and of the American Concrete Institute. President of the Institute from 1934 to 1936, he was awarded its Turner Gold Medal in 1939 "for contributions to science, direction of research, and outstanding leadership in advancing the intelligent utilization of cement and concrete." He is a fellow of the American Association for the Advancement of Science and a member of the American Chemical Society, the Washington Academy of Sciences, and the Cosmos Club. Author or coauther of several Bureau papers dealing with portland cement and related subjects, he has also contributed numerous articles to the technical journals in his special fields of activity.

Mr. Douglas E. Parsons has been named chief of the Division to succeed Mr. Bates. In charge of the Section on Masonry Construction, Mr. Parsons has been assistant chief of the Division since early in 1944.

NEW AND REVISED PUBLICATIONS ISSUED DURING SEPTEMBER 1945

Journal of Research [2]

Journal of Research of the National Bureau of Standards, volume 35, number 2, August 1945 (RP1665 to RP1667, inclusive). Price 30 cents. Annual subscription, 12 issues, $3.50.

Simplified Practice Recommendations [2]

R209–45. Peanut butter packages and containers. Price 5 cents.

Commercial Standards [2]

CS126–45. Tank-mounted air compressors. Price 10 cents.

Technical News Bulletin [2]

Technical News Bulletin 341, September 1945. Price 5 cents. Annual subscription, 50 cents.

MIMEOGRAPHED MATERIAL

Letter Circulars

[Letter Circulars are prepared to answer specific inquiries addressed to the National Bureau of Standards and are sent only on request to persons having a definite need for the information. The Bureau cannot undertake to supply lists or complete sets of Letter Circulars or send copies automatically as issued.]

LC797. Automobile painting.

LC798. Plastic paint.

LC799. Export trade expansion and retention through certification of quality. (Supersedes LC618.)

LC800. Building materials and structures reports published by the National Bureau of Standards (List.). (Supersedes LC552.)

LC801. House plan services. (Supersedes LC787.)

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[2] Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Subscription to Technical News Bulletin, 50 cents a year; Journal of Research, $3.50 a year (to addresses in the United States and its possessions and in countries extending the franking privilege); other countries, 70 cents and $4.50, respectively.

RECENT ARTICLES BY MEMBERS OF THE BUREAU'S STAFF PUBLISHED IN OUTSIDE JOURNALS [3]

Screw threads and standardization. Henry W. Bearce. Domestic Commerce (Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington 25, D. C.) 33, No. 9, 19 (Sept. 1945).

Rubber research in tropical Brazil. Norman Bekkedahl. India Rubber World (386 Fourth Avenue, New York 16, N. Y.) 112, No. 4, 451 (July 1945).

Factors affecting results obtained with the Mooney viscometer. R. H. Taylor. India Rubber World 112, No. 5, 582 (August 1945).

New Brazilian rubber laboratory in the Amazon valley. Norman Bekkedahl and Frederick L. Downs. Industrial and Engineering Chemistry, Analytical Edition (1155 16th Street, NW., Washington 6, D. C.) 17, 459 (July 15, 1945).

[3] These publications are not obtainable from the Government, unless otherwise stated. Requests should be sent direct to the publishers.

Notes on resin-bonded, wet-strength papers. C. G. Weber. Printing Equipment Engineer (1276 West Third Street, Cleveland 13, Ohio) 70, No. 5, 38 (August 1945).

Survey on adhesives and adhesion. R. C. Rinker and G. M. Kline. Technical Note No. 989 (National Advisory Committee for Aeronautics, Washington 25, D. C.) (August 1945).

Decarburization of seamless tubing of NE8630 steel. T. G. Digges and R. L. Sanford. OPRD Project 729 (Office of Production Research and Development, War Production Board, Washington 25, D. C.), (August 1945).

An improved method for detecting case-hardened glass as a mirror component. J. J. Diamond. Glass Industry (55 West 42d Street, New York 18, N. Y.) 26, No. 8, 372 (August 1945).

The testing of portland cements containing interground Vinsol resin. Raymond L. Blaine, Jason C. Yates, and John R. Dwyer. Preprint A3 Am. Soc. Testing Materials 260 South Broad Street, Philadelphia 2, Pa.), (August 1945).

U. S. GOVERNMENT PRINTING OFFICE: 1945